

WHAT IS CLAIMED

1. A combination of a polymer substrate and a surface graft polymer comprising:
a polymer substrate molded into a configuration to be accessible by light and capable of forming a free radical from a carbon or oxygen atom at the surface of the substrate;
a graft polymer adhered to the surface of the substrate wherein the graft polymer is comprised of at least one monomer and where the monomer is miscible in a solution comprising a chain transfer agent, and wherein the surface graft polymer forms a coating on the polymer substrate upon exposure to UV light.
2. The polymer substrate-graft combination of claim 1 wherein the solution contains a photo initiator.
3. The polymer substrate-graft combination of claim 1 wherein the solution contains a cross-linking agent.
4. The polymer substrate-graft combination of claim 1 wherein the solution contain a monomer selected from the group of PEG, AA, monomethoxy acrylate PEG, HEMA, or DMA.
5. The polymer substrate-graft combination of claim 1 wherein the graft polymer is comprised of at least two monomers.
6. The polymer substrate-graft combination of claim 1 wherein the solution contains a two monomers are selected from the group of PEG, AA, monomethoxy acrylate PEG, HEMA, or DMA.
7. The polymer substrate-graft combination of claim 1 wherein the substrate is PDMS.
8. The polymer substrate-graft combination of claim 1 wherein the substrate is PDMA.
9. An ocular lens having a polymer substrate and a surface graft polymer coated the surface of the substrate comprising:
a transparent polymer substrate that is permeable to oxygen;
a transparent surface graft polymer coating the polymer substrate wherein the graft polymer is comprised of at least one monomer that forms the surface graft on the substrate by exposure to UV light.
10. The lens of claim 9 wherein the substrate is shaped to conform to the surface of the eye.

11. The lens of claim 10 wherein the surface graft polymer is PEG.
12. The lens of claim 10 wherein the polymer substrate is a hydrogel.
13. The lens of claim 10 wherein the polymer substrate contains silicon.
14. A method to manufacture a contact lens comprising:
forming a lens blank of a transparent polymer shaped to conform to the surface
of the eye;
coating the lens blank with a surface graft polymer by immersing the blank in a
solution containing at least one monomer and a chain transfer agent and then;
exposing the lens blank and the monomer to UV light to form the graft polymer
as a coating on the surface of the lens.
15. The method of claim 14 wherein the substrate is a hydrogel.
16. The method of claim 14 wherein the substrate contains silicon.
17. The method of claim 14 wherein the solution containing at least one monomer is
selected from the group of PEG, AA, monomethoxy acrylate PEG, HEMA, or DMA.
18. The method of claim 14 wherein the solution containing at least two monomers
is selected from the group of PEG, AA, monomethoxy acrylate PEG, HEMA, or DMA.
19. A polymer microdevice formed of a polymer substrate and comprising:
microfluidic channels for fluid transport wherein the surface of the microdevice
is comprised of a graft polymer applied by coating the surface with a monomer solution and
exposure to UV light.
20. The microdevice of claim 19 wherein the graft polymer has a surface thickness
less than a depth of the microfluidic channels of the device.
21. The microdevice of claim 19 wherein the graft decreases the hydrophobicity of
at least a portion of the substrate polymer.
22. The microdevice of claim 19 wherein at least two different polymer grafts are
applied to the microdevice.
23. A method to produce a polymer microdevice comprising:
providing a microdevice having a polymeric substrate, a plurality of
microchannels for fluid movement, and a reservoir for containing reagents,
applying a polymer graft to the surface of the microdevice.
24. The method of claim 23 wherein the graft polymer is formed by exposure of
monomers in solution to UV light.
25. The method of claim 23 wherein the solution containing monomers also

contains a chain transfer agent.

26. The method of claim 23 wherein the solution containing monomers also contains a cross-linking agent.

27. The method of claim 23 wherein the solution containing monomers also contains a photoinitiator.

28. The method of claim 23 wherein the graft polymer is formed of monomers selected from the group of PEG, AA, monomethoxy acrylate PEG, HEMA, or DMA.

29. The method of claim 23 wherein the graft polymer is formed of at least two monomers selected from the group of PEG, AA, monomethoxy acrylate PEG, HEMA, or DMA.

30. The method of claim 23 further comprising forming a second polymer graft on the surface of the microdevice.